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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : PATENT  
Michael KAMLEITER et al. : Confirmation No. 4931  
Serial No.: 10/582,349 : Art Unit: 1797  
Filed: January 8, 2008 : Examiner: K. S. Menon  
For: METHOD FOR THE PRODUCTION :  
OF TUBULAR MEMBRANES :

**RESPONSE**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Responsive to the October 28, 2010 final Office Action, please amend the above-identified application as follows:

Claims 10-33 are pending in the application, with claims 10 and 33 being independent.

**Rejections Under 35 U.S.C. § 112, First Paragraph**

Claims 16 and 24 stand rejected under 35 U.S.C. §112, first paragraph, on the ground that the specification does not provide adequate information to enable the invention to be made and used in connection with graphite powder and activated charcoal. The specification is only found to be enabling for various fibers and filaments.

In this connection, page 5, line 34, specifically refers to filaments of "graphite powder", "activated charcoal" and "ones constructed of powder". Obtaining such threads of graphite

powder and activated charcoal are known. For example, U.S. Patent No. 7,695,026, at col. 10, lines 35-40, refers to functional powder carried in a carrier such as synthetic fibers, where activated charcoal is specifically referenced as one of the powders. This supports the disclosure since it adequately shows knowledge by others as of its May 13, 2004 effective filing date. This date is before the September 17, 2004 International and effective U.S. filing date of this application. Additionally, U.S. Patent No. 4,740,434 (e.g., at column 2, lines 38-45) discloses “activated charcoal fibers”; U.S. Patent No. 5,595,659 (column 4, lines 22-24) discloses fibers with “activated charcoal”; U.S. Patent No. 5,071,070 (e.g., at column 2, lines 26-27) discloses a “graphite short fiber”; and U.S. Patent No. 5,134,030 (e.g., in claim 38) refers to “fibers impregnated with . . . graphite powder.” These additional patents clearly show that one skilled in the art could make and use fibers of activated charcoal and of graphite powder, as claimed.

This rejection also appears to involve a misinterpretation of the claims in interpreting monofilaments or multifilaments of graphite powder and activated charcoal as being formed exclusively of those products. However, the graphite powder and activated charcoal need only be a part of the monofilaments or multifilaments of the nature described in the above patents.

No evidence is supplied that such threads are not known such that the rejection fails to comply with the requirements of M.P.E.P. §2164.04. Thus, the application adequately supports all claimed subject matter as required by 35 U.S.C. §112.

#### Rejections Under 35 U.S.C. §103

Claim 10 covers a method of producing membranes comprising constructing a tubular body 10 having a longitudinal axis from a plurality of threads such that some of the threads are tied substantially firmly together along fillet-shaped connecting lines 14 with continuous

longitudinal threads parallel to the longitudinal axis. Between the fillet-shaped connecting lines, at least some of the threads are formed as planar transverse connections 16 between mutually adjacent ones of the fillet-shaped connecting lines. A predefinable membrane material is applied to the tubular body.

By forming the membranes in this manner, optimal tubular membranes can be obtained at a high production rate and at low cost. Moreover, these tubular membranes will not suffer undesired stretching effects. The production method is particularly enhanced by membranes being produced continuously, and thus, inexpensively.

Claims 10-14, 16-26 and 28-33 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,034,129 to Ten Hove in view of U.S. Patent No. 6,454,942 to Shintani, with further evidence from U.S. patent publication 2002/0046970 to Murase or U.S. patent publication 2003/0098275 to Mahendran. The Ten Hove patent, particularly relative to Fig. 4, is cited for a process of making a membrane having a woven or knitted tube 11 over a mandrel 8 and then another non-woven, woven or knitted tube 12 slipped over tube 11, with a woven or knitted tube allegedly being an alternative to the non-woven external tube 12. A membrane allegedly is applied to the inside of tube 11 (col. 4, lines 10-29), with the membrane material being polysulfone, PVdF and the fabric material being plastic or polyester. The forming of the membrane is allegedly disclosed by coating and then passing through a precipitation bath (col. 4, lines 34-36). The Shintani patent is cited for a tricot fabric as a membrane support having fillet-like connecting lines transversely linked by threads forming transverse connections. In support of the rejection, it is alleged that it would be obvious to use the Shintani structure for providing a tricot weave for tubes 11 and 12 of the Ten Hove structure. Additionally, tricot

weave is allegedly knit weave produced by a crocheting device with hook needles with the fillet lines less permeable than the space between them and with the tricot being polyester or similar polymer. The angle between adjacent transverse filaments is allegedly shown or obvious from the Shintani patent. The Ten Hove and Shintani patents in combination are alleged to teach a tubular membrane. The plastic materials are also allegedly taught by these two patents. The newly cited patent publications are also apparently cited for teaching the use of other materials for the fibers.

Claims 10-14, 16-26 and 28-33 also stand rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,359,735 to Stockwell or under 35 U.S.C. § 103 as being unpatentable over the Stockwell patent with further evidence from the Shintani patent and the Murase and Mahendran patent publications. The Stockwell patent is cited for teaching a method coating a breathable material over a circular knit fabric of a tricot weave (col. 3, lines 64-69). Although the Stockwell patent is stated as not having the details of the tricot weave, such details are allegedly taught by the Shintani patent in the same manner as the above rejection. The materials for fibers are alleged as being obvious, as allegedly taught by the Murase and Mahendran publications.

The pending claims are patentably distinguishable over the cited patents, particularly over the Shintani patent, by the continuous longitudinal threads parallel to the longitudinal axis. Relative to this feature, page 9 of the Office Action states that the ball 22 in Fig. 1 of this application is the best representation of the longitudinal thread in the specification which is alleged to be the equivalent of the knots shown in the figure of the Shintani patent. However, the

longitudinal threads are best shown by the lines 14, not the balls 22, demonstrating that the Shintani knots are not the equivalent of the claimed longitudinal threads.

While the Ten Hove patent discloses a membrane assembly, admittedly, no details are provided therein regarding the knitted tubes 11 and 12. Particularly, neither of the Ten Hove knitted tubes are disclosed as being constructed of a tubular body having the specific thread arrangement recited in claim 10. Such deficiencies are not cured by the Shintani patent.

The Shintani patent discloses a liquid separation membrane module that does not appear to show it formed into a tubular body. Though Figs. 4 and 5 illustrate a spiral wound type liquid separation module using the channel material, that embodiment does not provide a tubular body in which the threads are constructed, as recited in the method of claim 10. Specifically, claim 10 recites that the fillet-shaped connecting lines have continuous longitudinal threads 14 parallel to the longitudinal axis. No continuous longitudinal threads are provided in the knotted fillet lines alleged to be provided in the Shintani tricot fabric. Additionally, claim 10 recites forming at least some of the threads as planar transverse connections. The transverse connections allegedly present in the Shintani fabric are not shown to be planar.

Longitudinal tensile stretches arising during filtration are taken up by the continuous longitudinal threads along the fillet-shaped connecting lines. The stresses at the periphery are taken up safely by the transverse threads by way of the planar transverse connections. These features are clearly not disclosed or rendered obvious by the Ten Hove and Shintani patents considered individually or in any obvious combination there.

The rejection based on the Stockwell patent in view of the Shintani patent suffers the same deficiencies. Admittedly, the Stockwell patent does not disclose the details of the tricot

weave necessary to meet the claim limitations. Such deficiencies are not provided by the Shintani patent for the same reasons advanced above relative to the combination of the Ten Hove and the Shintani patents. Those reasons are not repeated to avoid burdening of the record.

Since the Shintani patent does not have a stable connection between transverse threads and longitudinal threads at the connecting points forming the connecting lines, the Shintani knitted structure is flexible, leading to undesirable stretching. Accordingly, claim 10 is patentably distinguishable over the Ten Hove, Shintani and Stockwell patents considered individually or in any obvious combination thereof. None of the other cited patents cure these deficiencies in the patents applied in the rejections.

Claims 11-22, being dependent upon claim 10, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents.

Claim 11 is further distinguishable by the specific crocheting steps. Such steps are not shown to be disclosed or obvious from the cited patents.

Claim 12 is further distinguishable by the crocheting with passages and the connecting lines formed to be liquid tight or with a low flow rate. Those features are not shown to be disclosed or rendered obvious.

Claim 13 is further distinguishable by the specific materials recited.

Claim 14 is further distinguishable by the specific materials recited.

Claims 15 and 16 are further distinguishable by the specific threads recited there that are not shown to be disclosed or rendered obvious by the cited patents.

Claims 17 and 18 are further distinguishable by the specific angles between the threads of the transverse connection. Such angles are not shown to be disclosed or rendered obvious by the cited patents.

Claims 19 and 20 are further distinguishable by the numbers of sides. These numbers of sides are not disclosed or rendered obvious by the cited patents.

Claims 21 and 22 are further distinguishable by the specific membrane materials recited therein.

Claim 23 is further distinguishable over the Ten Hove, Shintani and Stockwell patents for the same advanced above. Such reasons are not repeated to avoid burdening of the record.

Claims 24-33 are further distinguishable for the same reasons advanced above relative to claims 12, 13, 14, 15, 16, 17, 18, 19, 20 and 22, respectively, which reasons are not repeated to avoid burdening the record.

Accordingly, claims 10-33 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,

  
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